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PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant	:	Weiling Peng, et al.)	Group Art Unit: 1774
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Appl. No.	:	10/770,739)	
)	
Filed	:	February 3, 2004)	
)	
For	:	PRE-FINISHED AND)	
		DURABLE BUILDING)	
		MATERIAL)	
)	
Examiner	:	Camie S. Thompson)	
)	

DECLARATION UNDER 37 C.F.R. 1.132 OF WEILING PENG

Commissioner of Patent
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

I, Weiling Peng, do declare as follows:

1. I am an Adhesive Specialist at James Hardie Research USA, LLC.
2. I have a Bachelor of Engineering Degree in Polymer Synthesis, a Master of Engineering Degree in Polymer Materials, and a PhD in Wood Science.
3. I have over 15 years experience in building products and with employing adhesive materials for such products.
4. I am a co-inventor listed on the above-identified application (hereinafter "the Application").
5. I understand the Application describes various embodiments of my invention, which is directed to a pre-finished and durable building material. As shown in Figure 1, one embodiment of the building material is a laminate structure having a cementitious substrate or core, at least one layer of resin-impregnated paper, and an elastomer between the substrate and the resin-impregnated paper. I designed the elastomer to provide stress-relief between the substrate and resin-impregnated paper. I consider this to be an inventive feature of the building material I co-invented.

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6. The concept of using an elastomer between the substrate and the resin-impregnated paper began with an idea of using a laminate structure for limited outdoor/extreme indoor applications. My co-inventors and I discovered that prior art laminate structures, while capable for limited indoor applications, were not well suited for high moisture indoor areas or limited outdoor areas. In particular, when such prior art structures are repeatedly exposed to cycles of varying heat and/or moisture, the pre-laminated resin-impregnated papers will peel away from the cementitious substrate causing the structure to delaminate. My co-inventors and I discovered that this problem results from the fact that pre-laminated resin-impregnated papers have a much higher dimensional movement under heat and moisture than cementitious panels.

7. Because of the differences in dimensional movement between those two layers, my co-inventors and I worked on developing a building material with a stress-relieving layer between the substrate and the resin-impregnated papers so that the structure will not tear apart under repeated cycles of low and high humidity, and cold and hot temperatures. Our solution was to use an elastomer as the stress-relieving layer.

8. Our solution also involved using an elastomer with characteristics that would provide enough stress-relief for a laminate structure in an outdoor environment. Accordingly, we created a laminate having an elastomer with an elongation of between about 20% and 1200%. That elastomer could also have a modulus of elasticity at 100% elongation of between about 10 and 10,000 psi and have a glass transition temperature between about -90 and 50°C.

9. I am aware that the Patent Office has issued an Office Action in the Application on December 28, 2005 and asserts that the claimed invention is anticipated by U.S. Patent No. 5,425,986 to Guyette and that the Examiner references Hawley's Condensed Chemical Dictionary, Fourteenth Edition, Richard J. Lewis, Sr. in the rejection. I further understand that the Examiner, on that basis, rejected many of the claims of the Application under 35 U.S.C. § 102(b).

10. I have reviewed the Office Action and the claims submitted in the response with this Declaration. I have also reviewed the Guyette and Lewis references.

11. In my opinion, neither Guyette nor Lewis, individually or in combination, teaches each and every limitation of the claimed invention for the reasons discussed below.

12. I understand that Guyette provides for an optional adhesive between two layers and that the Examiner asserts that this adhesive could be an elastomer. (See Guyette at col. 6, lines 15-

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16; *see also* Office Action at p. 4.) However, based on my review of Guyette, it is my understanding that Guyette does not contemplate an elastomer or even that its adhesives have the specific properties recited in Claims 22-26. Importantly, there is no mention or suggestion in Guyette that the adhesives could have elastomeric properties, let alone the specific properties of Claims 22-26. Yet, there are at least four other reasons why one of ordinary skill in the art would not understand Guyette as disclosing an elastomeric adhesive.

13. First, the laminate structure of Guyette is designed strictly for limited indoor use and thus, there would be no need for an elastomeric layer. (*see* Guyette at col. 1, lines 53-62.) Most indoor areas generally provide for a stable and constant environment that does not experience extreme conditions of heat/cold and moisture/dryness. Accordingly, an indoor laminate would not be designed to account for high moisture and heat conditions or limited exterior weather conditions. As such, one of ordinary skill in the art, when designing an indoor laminate, would not recognize and thus, would not be concerned with the potential for differential movement between the paper layer and the cementitious layer. To address a non-issue such as that would add unnecessary cost and expense in designing and manufacturing indoor laminates that target such areas as hallways or living areas. Therefore, one of ordinary skill in the art would not understand Guyette to teach an adhesive having elastomeric properties, let alone an elastomer having specific properties, between the substrate and paper layer.

14. Second, it is more likely that Guyette provides for the use of rigid adhesives than adhesives that have elastomeric properties. Adhesives used for structural applications provide a rigid bond. In the case of Guyette, Guyette seeks to create a unitary laminate structure that is able to withstand high pressures. (*see* Guyette at col. 1, lines 44-46; *Id.* at col. 7, lines 22-24.) One of ordinary skill in the art would understand that Guyette does not want to use an adhesive that could stretch under pressure or under service loads. Rather, because Guyette seeks to create a structure that could withstand such loads, Guyette would want to create a strong rigid bond between the layers and to use a structural adhesive that could create such a rigid bond.

15. Third, Guyette discloses adhesive materials that do not necessarily have elastomeric properties. Guyette provides for adhesives that could be made from epoxy, isocyanate/urethane, and polyvinyl acetate. The Examiner states that those adhesives could be an elastomer. In support of that assertion, the Examiner references Lewis. However, one of ordinary skill in the art would

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not understand those adhesives as necessarily being an elastomer. Indeed, a review of Lewis confirms my understanding. Lewis states that epoxies are characterized by toughness; that polyurethanes have excellent hardness; and that polyvinyl acetate is a strengthening agent. (see Lewis at p. 447; *Id.* at pp. 903-904.)

16. Fourth, I tested laminate structures based on the teachings of Guyette and found that those structures will delaminate when exposed to extreme variations in humidity and temperature common in harsh indoor environments (i.e. bathrooms and kitchens) and limited outdoor environments. For instance, I have found that such laminate structures will delaminate at the cementitious core when the structure was dried in an oven at 60°C for about 2 hours. When the claimed invention was placed under similar circumstances, the structure did not delaminate. This was also true for the claimed structures recited in Claims 22-26.


17. In particular, I found that placing an epoxy between a substrate and resin-impregnated paper did not provide sufficient stress-relief to withstand being dried in an oven at 60°C for about 2 hours. That was also true when I substituted epoxy for isocyanate/urethane in a separate test and for polyvinyl acetate in another test.

18. I also found that placing the adhesives of Guyette between a substrate and resin impregnated paper did not provide sufficient stress-relief to withstand the test conditions recited in Claims 14-16. I found that the adhesives of the claimed invention were able to handle the movement of two different materials when bonded by the elastomers cited.

19. Therefore, I conclude that neither Guyette nor Lewis, individually or in combination, anticipate the invention I claim.

20. I declare that all statements made herein of my knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made may jeopardize the validity of the above-identified application and any patents issuing thereon.

Dated: 3/27/06


Weiling Peng